

THE JOHN OLIGER CO.  
11601 WHIDBEY DR.  
CUMBERLAND, IN 46229

PRODUCT LIST FOR THE TS2068

WE PAY POSTAGE (First Class) on all orders to continental USA or Canada. Other foriegn countries add 10% for post/packing. Indiana residents add 5% sales tax. Prepaid orders only, no credit cards. Prices subject to change without notice. NOTE: All of the boards below, as well as all future John Oliger Co boards, are designed with edge trace "fingers" to fit the 2068 Expansion Board below. The ONLY exception to this is the 2068 User Cartridge, which plugs into the cartridge slot on your computer and the Vpp Supply which is a free standing board. All my kits include a 10 day money back satisfaction guarantee, if returned UNSOLDERED and in same condition recieved. Assembled units are guaranteed to work as promised or will be repaired free for 30 days from shipment date, if faulty in material or workmanship.

2068 USER CARTRIDGE BOARD      Bare board:\$11.95 (or 3@31.95)      Board w/parts (ex eeprom):\$15.95  
3pcs board w/parts:\$45.95      Assembled & tested:\$20.95ea or 3 for \$59.95 post pd (no eeproms)

Also available w/gold plated edge traces. Add \$3.00 per board to above prices for these gems.

ATTN: Software Producers & Users Groups: Write for a quote on quantities of 10pcs. or more.

This board is designed to plug into the cartridge port of the 2068 computer. The board can hold 2-2764 or 2-27128 eeproms in any combination. It allows the 2068 computer owner, when used with the 2068 or TS1000 programmers, to store his own Basic programs in cartridge form for fast and easy access. The board's purchase includes assembly instructions, schematic, and instructions for its use with Basic programs. Although this board CAN be used with MC programs or to make such things as Spectrum Emulators, the documentation included with the board does not cover these uses because of thier complexity. This is left to the user to figure out, hopefully with the help of the TS2068 Technical Manual. This board features PLATED THROUGH HOLES and is VERY easy to assemble.

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2068 EXPANSION BOARD      Bare pc board:\$14.95      Board w/parts:\$43.95  
Assembled and tested Oliger 2068 Expansion board \$54.95.

Also available with gold plated rear edge traces. Add \$3.00 per board to above prices for these. This compact (3 3/4" \* 4 3/8") expansion board is designed to plug into the rear expansion connector of your 2068 computer. All of the 2068 boards from John Oliger Co., except the 2068 User Cart board are designed to plug into this expansion board, (the boards have male edge traces, and plug into this board similar to the way new boards are plugged into the Apple computer) so this one is a must if you plan on adding more circuits to your 2068 with John Oliger Co. products. The board includes one "spare" 20 pin ic socket for a user circuit, a rear edge connector feedthrough for attaching the 2040 printer, modem, etc., and the nec. circuitry for an ultra stable RGB monitor interface. (NOTE: The use of the RGB circuitry requires opening your 2068, cutting one trace, and installing one jumper.) The board's purchase includes assembly instructions and a schematic of the RGB interface. The parts kit for this one includes five precut & slotted edge connectors, 2 ic sockets, 1 74HC00 IC, and 1pc 47K Ohm 1/4W resistor. This board features PLATED THROUGH HOLES. NOTE: This board requires good soldering abilities for assembly as there are many narrow pads surrounded by board traces to be soldered. This board requires more intricate soldering than any other Oliger Co. printed circuit board. If you are not GOOD at fine detail soldering I recommend buying this board assembled.

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2068 EPROM PROGRAMMER      Bare board:\$12.95      Board w/pts (no eeproms):\$25.95  
2068 Pgmr asmbld & tstcd:\$33.95      Add \$3.00 per board for gold plated edge traces.

This board adds the capability of programming 2764 & 27128 eeproms to your 2068 system. This one is a must for serious use of the 2068 User Cart board. This board comes with complete documentation on its assembly, use, theory of operation, tips, and details on replacing the Home rom of the 2068 w/a 27128 eeprom. This programmer requires the Vpp Power Supply (below, recommended) or a 4-22VDC regulated adjustable power supply w/voltmeter. This board features PLATED THROUGH HOLES. NOTE: This programmer may also be used on the TS1000 for 2764s only, and in fact responds to software exactly like the TS1000 2764 programmer when this board's select switch is set to "64". This board replaces the Oliger TS1000 2764 programmer but you can only program 2764 type eeproms on the TS1000/ZX81 with this board. If ordering for use on the TS1000, request the TS1000 programmer's documentation on ordering and this will be included with your order at NC.

Board w/bd mounting pts: \$9.95

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Kit of board w/parts: \$24.95 *FOR P. Port w/o*

Gold board w/parts: \$27.95

Printer cable for this port:\$14.95 (standard Apple II to Epson type,3ft.) <sup>IF</sup> <sub>SOFTWARE</sub>

This very small but very capable Centronics type printer port for your 2068 will drive most any printer that has a Centronics type parallel interface. The port uses the same port and BUSY bit assignment used by the Aerco 2068 printer I/F, and thus is compatible with the vast amount of 2068 software that supports this interface. This port is fully decoded and contains a "PRINTER READY" LED to show your printer's current status. Software on cassette included with this port allows use of the standard LPRINT and LLIST commands and use of AT, TAB, and "," the full width your printer is capable of. Also included are hi-res screen dumps (via RAND USR call) for the Okidata dot addressable graphic printers, the Olivetti PR2300 Ink Jet printer, the Gemini 10X printer, and the Gorilla Banana printer. An ASCII screen dump of ASCII characters is also included for use with ANY printer. Unlike most other 2068 printer driver software, THIS software mainly resides in the 2040 printer buffer, using absolutely none of the ram normally used by Basic and well out of the way for opening DFIL2 on the 2068. The printed circuit board is plated through, very easy to assemble, and also avail. w/gold plated edge traces. Annotated assembly listings of the machine code software are included in this port's 15 page user manual (supplied) for ease of customer custom modification and an aid in learning how routines such as these operate on your computer. The software to drive this port is BUILT IN to the Olliger 2068 Disc I/F!

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Kit of board w/parts:\$16.95

Also available with gold plated edge traces @ \$3.00 add. per bd.

This small joystick board is designed to plug into your 2068 expansion board to emulate the Kempston Joystick interface. This interface is for use with a Spectrum emulator, rom, or Romswitch and Spectrum software. It is supported by any Spectrum software that is "Kempston compatible" looking to the software exactly like the real Kempston Joystick interface. Hardware wise this interface differs from the real Kempston in the fact that the port is FULLY DECODED so that there can be no hardware conflicts when using this device with other hardware add-ons and your 2068 (Such as the soon to be released Olliger 2068 Disc Drive Interface). This board features plated through holes and is easy to assemble. The port itself will also function on the ZX81/TS1000/TS1500, but may fight other hardware on these machines that is not fully decoded (such as the Olliger TMS9918A Video Project) and mc will be required on these computers to access the device located at Z80 port 1FH, as the '81 lacks the "IN" command. Documentation included with the unit covers only its use with the TS2068 computer.

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(MAIL ORDER SALES ONLY)

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CUMBERLAND, IN 46229

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CITY, STATE, &amp; ZIP:

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Have you ordered from John Oliger Co. before?

Comments or suggestions:



THE JOHN OLIGER CO.  
PRODUCT LIST FOR THE ZX81/TS1000

NOTE: 2068 PROJECTS ARE RECOMMENDED OVER TS1000 PROJECTS. 2068 PROJECTS ARE OF MUCH MORE RECENT DESIGN...WE ALL GET BETTER WITH EXPERIENCE!

WE PAY POSTAGE (First Class) on all orders to continental USA or Canada. Other foreign countries add 10% for post/packing. Indiana residents add 5% sales tax. Prepaid orders only, no credit cards. Prices subject to change without notice. Allow 3-4 weeks On all ZX81/TS1000 project orders as these boards are made in house to order at this time. All projects are designed for the ZX computer electronics experimenter/hobbyist with at least some experience at electronic kit building. All boards except the Vpp Supply are double sided with edge connector "fingers", and are meant to be used in either of the two expansion boards, below. All boards are G10 or FR4 epoxy substrate with solder plated traces. All are completely cut and drilled, but no ZX81/TS1000 board features plated through holes. Feedthrough wires must be installed by the user when building. I offer a 10 day money back satisfaction guarantee on all my products if the product is returned AS RECEIVED in that amount of time. Exchanges will also be honored for this period too if sufficient funds for return postage of the exchanged product are sent with the return. No returns or exchanges will be accepted after 10 days of your order's receipt. Documentation included with each project is detailed in each project's description. Many projects require having read articles previously published in the now defunct SQ magazine.

64K DYNAMIC RAM

Bare board:\$19.95

Kit of board w/parts:\$34.95

Kit does NOT include the ram chips themselves. Builder must purchase these separately from other sources listed with project (currently about \$2.95ea from JDR Microdevices). This 64K DRAM board, featured in SQ#3 (Xerox copy avail. @\$2.50pp) is a full feature 64K ram board for the TS1000, TS1500, or ZX81. Special features of this memory not found on other 64K rampacks include: 8-12K on/off switch, 12-16K on/off switch, two banks of 8K ram available mapped 8-16K (Bank A/B switch), and 48-64K on/off switch. This circuit uses "pin 1 refresh" type 4164 dram chips for reliable refresh on the ZX81, TS1000, and TS1500 computers.

PARALLEL PRINTER PORT

Bare board:\$10.95

Kit of board w/parts:\$22.95

This project was detailed completely in SQ#s 1&2, and the reading of this two part article in a must for the project builder. (Xerox copy of this available @ \$5.00pp) The actual port is memory mapped at location FFFFH, and is completely decoded. This project only includes its schematic, a theory of operation sheet, and a mc listing w/comments of a copy routine for use with the Okidata ML80 and ML82A printers. The circuit and software can be adapted to most other Centronic compatible printers. To achieve full use of the basic printer commands, the Sinclair rom must be patched by putting it on eprom. (Detailed in article) Thus, access to an eprom programmer and reader is a must to make the port user transparent. Because the 2716 programmer and reader used in the original article are no longer available, it is now suggested that the 2764 programmer be used and a 2764 eprom be installed inside your computer, requiring 2 trace cuts and 2 jumpers to your ZX81 or TS1000 computer. An additional 2764 reader can then be used in the 8-16K area to hold another 2764 that contains the actual printer driver software. (Or use the Video Project Board "B" if you also have this) This board requires Rom and Ram decode via use of a 64K memory, etc., and is recommended only to the serious hacker. NOTE: Two new software titles are now available that support this printer interface and/or the Oliger TMS9918A Video Project described later. The first is entitled "SMART TEXT ZX/TS" from Gulf Micro Electronics (1317 Stratford Ave. Panama City, FL 32404) This package is a text editor/WP that includes many functions-including "Interactive Office Tools". Written entirely in Basic for easy custom modification, this program includes a 35 page manual with possible updates for users in the future. Price is \$29.95pp. Specify use for standard ZX/TS or Oliger VDP when ordering-enclose a SASE for more info. The second new(?) program supporting this port and/or the Oliger VDP system is the ram based version of "Memotext" from Fred Nachbaur (C-12, Mtn. Station Group Box, Nelson, BC V1L 5P1, Canada). Fred has several versions of this program available for different locations in ram (8-16K area, top of 16K ram area, or 32-48K area if mc mod. from SQ or SWN is added to your ZX/TS and you have the memory here). This is the famous WP originally released as a hardware add-on for your computer, now available on tape with many additional enhancements added. Prices are \$29.95 US \$\$ post paid for the cassette version (specify area of memory desired for its use when ordering) or \$34.95 for a version on eprom made to run from the video project's board "B" Eb eprom socket. The eprom version is currently under development and will feature full upper and lower case characters on the screen using the video project! Please inquire to Fred as to availability of this eprom or for more information on the tape version.

2764 EPROM PROGRAMMER

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THE TS1000 2764 PROGRAMMER IS NO LONGER AVAILABLE. THE 2068 EPROM PROGRAMMER SET TO "64" FOR 2764 EPROMS DIRECTLY REPLACES THE OLDER TS1000 PROGRAMMER. ORDER THIS PROGRAMMER FROM PRICES LISTED ON THE 2068 PRODUCT LIST AND REQUEST THE OLDER TS1000 2764 PROGRAMMER'S DOCUMENTATION TO PROGRAM EPROMS ON THE TS1000. YOU CAN ONLY PROGRAM 2764 EPROMS ON THE TS1000 WITH THE 2068 PROGRAMMER. YOU WOULD NEED A 2068 TO ALSO PROGRAM 27128 EPROMS. (Rom decode via use of Oliger 64K memory, etc., required for the programmer's use on the ZX81/TS1000).

Vpp POWER SUPPLY

Bare board:\$4.49

Board w/bd mounting parts:\$9.95

See the Oliger TS2068 Product list for details on this one.

## 2764 \* 2 EPROM READER

Bare board:\$10.00 or 3@\$25.95

Board w/parts:\$15.95 or 3@\$39.95

While small in size and complexity, this board is versatile in that it is capable of mapping either of its 2764 eeproms anywhere in the 64K map in 8K blocks (within reason). This board is intended to be used as a "cartridge" for storing Sinclair programs on eeprom, although it may be used to store commonly used mc "tools" etc. in the 8-16K block. This board comes only with its schematic, assembly instructions, and theory of operation sheets as full details of its use as a cartridge are provided with the 2764 Programmer's documentation. Rom and ram decoding via use of Olliger 64K memory is required. This circuit itself can decode the rom if one jumper is installed.

# MEMORY ACCESS MONITOR

Bare board:\$5.95

Kit of board w/parts:\$9.95

This very small board is a very simple circuit that indicates via use of eight LEDs where in the 64K memory map the Z80 cpu is reading or writing. The circuit uses only one IC and is extremely easy to assemble. Although this circuit does not actually do anything, it can be very useful in debugging hardware projects and mc programs that cause the computer to crash by indicating where the cpu is after the crash. Only a schematic is included with this one because it is simple enough to only require this for construction. This circuit also works well on the TS2068.

TMS9918A VIDEO PROJECT/UPGRADE

Bare board "A":\$14.95

Kit of board "A" w/parts:\$37.95

Bare board "B":\$11.95

Kit of board "B" w/parts:\$17.95

Complete package of boards "A" w/parts and board "B" w/parts:\$48.95 (Save \$6.85!) (Parts kits do NOT include the TMS9918A VDP, its 10.7386Mhz crystal, or the required 2764 eprom. Sources are listed in the documentation included for purchasing the VDP and crystal.) This project (my most complex to date) is a very involved upgrade for your ZX81/TS1000 computer. Its main features allow a SLOW mode almost as fast as FAST mode, a BLINK FREE FAST mode, lower case characters on screen instead of upper case inverse characters, etc. This project requires a composite type video monitor, the 2764 or 2063 Eprom Programmer, the Video Cassette (below) to make programming easier, and a lot of kit building knowledge! For more details on this one, please send a SASE. This project includes COMPLETE documentation and source listing w/comments of the new firmware.

TMS9918A VDP ENHANCED BASIC PROGRAMMING CASSETTE for use with the video project:\$6.95

4-SLOT TS1000 EXPANSION BOARD

Bare board:\$10.95

Kit of board w/parts:\$32.95

## 6-SLOT TS1000 EXPANSION BOARD

Bare board:\$15.45

Kit of board w/parts:\$43.95

Either of these two expansion boards are required to "plug" the other boards listed above into your system. The 4-slot board features four 25/50 pin double read out "slots" along with three 20 pin experimental IC socket pad areas. The 6-slot board is similar to the 4-slot, but has six "slots" and six 20 pin IC socket pad areas for user circuits. No buffering circuitry is included on either board. The complete kits contain fully cut and slotted prime edge connectors, IC sockets, and hardware to use as "feet" for the board.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

+-+-+-+---CUT HERE+-+-+-+---CUT HERE+-+-+-+---

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CUMBERLAND, IN 46229

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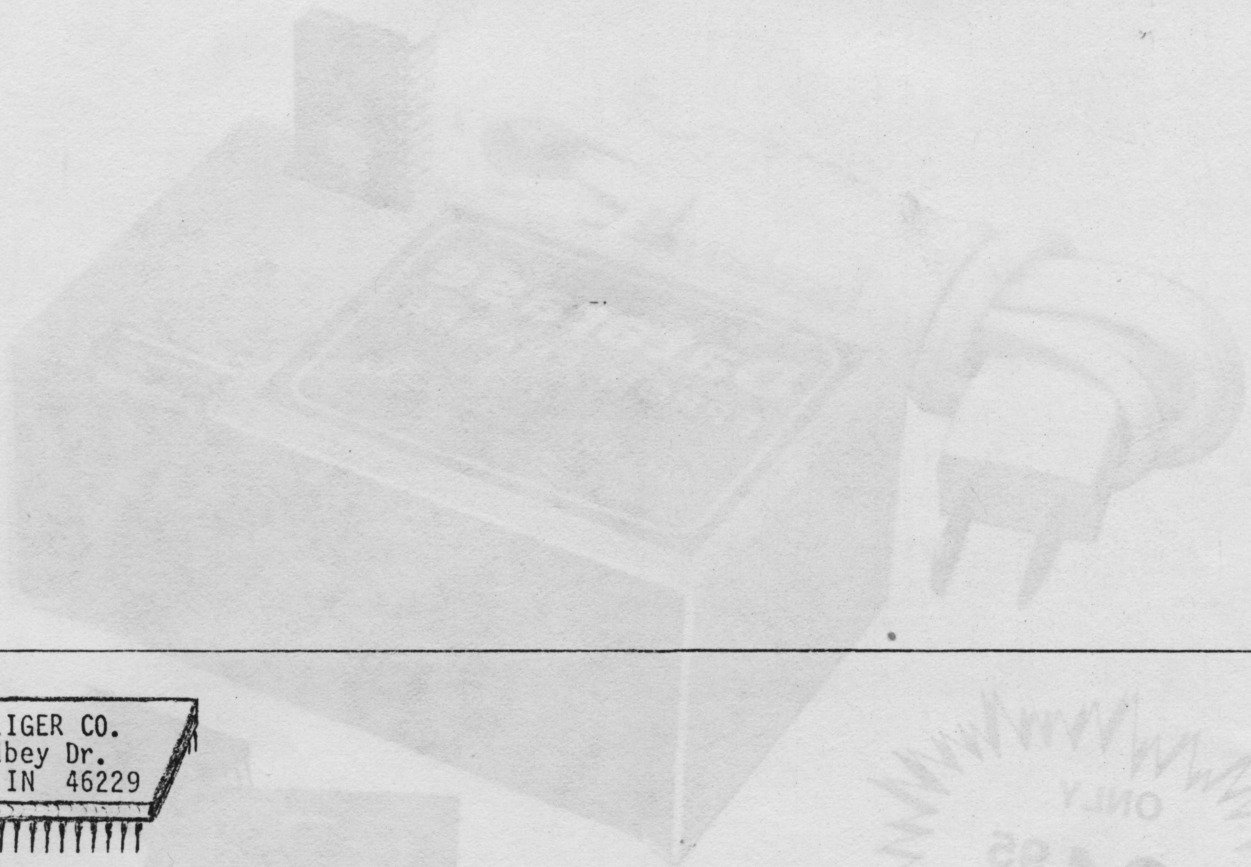
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ERASES MOST EPROMS  
in 3 Minutes



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TO:

A compact and inexpensive Eeprom eraser for the Hacker. It erases two chips per exposure, so if you are one of those smart people who only makes little mistakes and only needs to erase two Eeproms at a time, this eraser is for you.

AVAILABLE FROM:

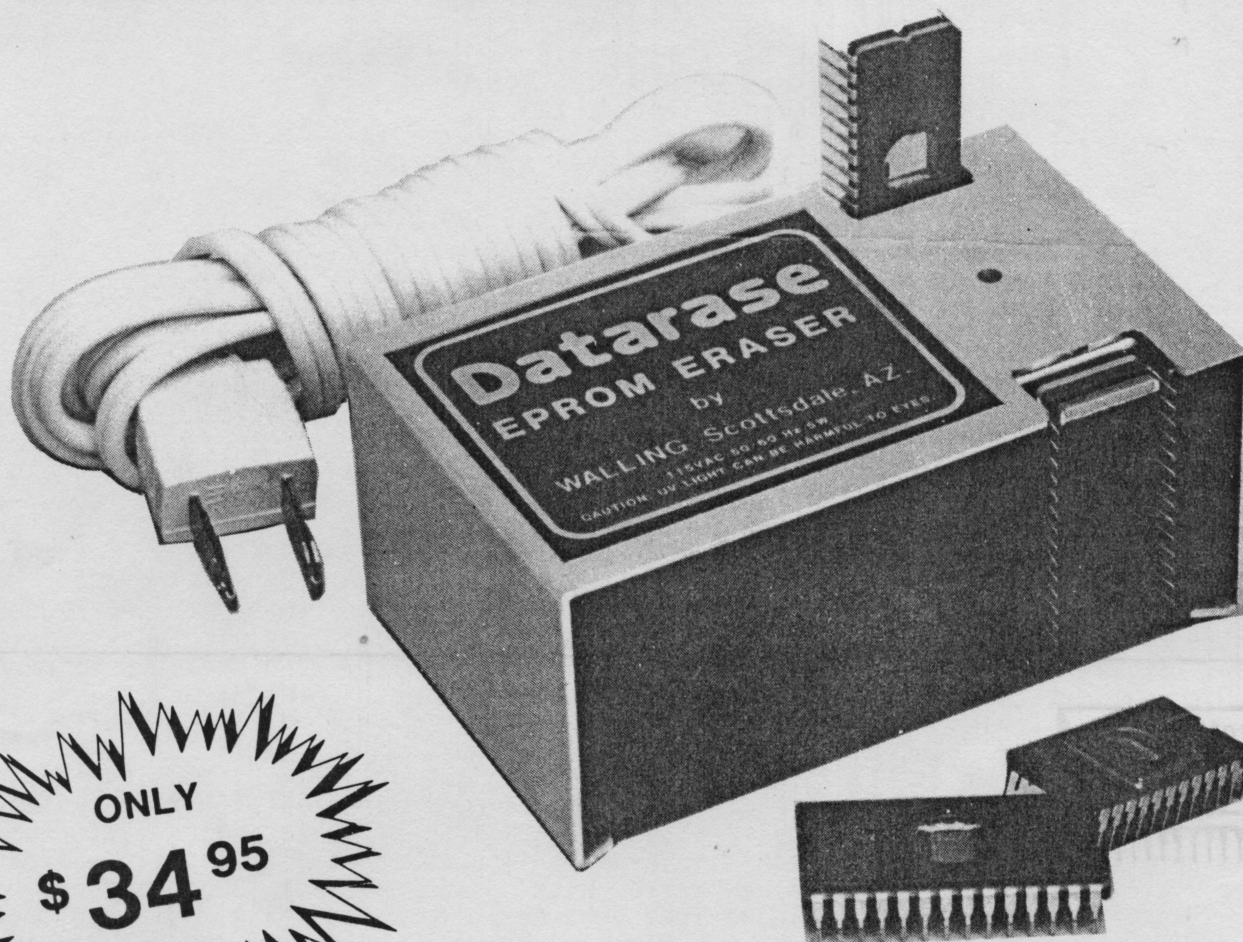
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For all 24 and 28 pin EPROMS  
60-day warranty

WALLING CO.  
TEMPE, ARIZONA

# ERASES MOST EPROMS

## in 3 Minutes



ONLY  
**\$ 34<sup>95</sup>**

+ \$2.50 POST/PACK = \$37.45PP

A compact and inexpensive Eprom eraser for the Hacker. It erases two chips per exposure, so if you are one of those smart people who only makes little mistakes and only needs to erase two Eproms at a time, this eraser is for you.

For all 24 and 28 Pin EPROMS

~~90 Day~~ <sup>Cmos</sup> Warranty

**WALLING CO.**  
TEMPE, ARIZONA

AVAILABLE FROM:

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11601 Whidbey Dr.  
Cumberland, IN 46229



## OLIGER 2068 DISK SYSTEM PRICES AND BASIC INFORMATION

DISK BOARD "A"

Bare pc only: \$17.95pp

Kit of board with parts: \$55.95pp

Assembled & tested: \$66.95pp

Two drive data cable for above, 3 foot long total: \$16.95pp

Four drive data cable for above, 4 foot long total: \$26.95pp

WD1770PH-00 disk controller chip: \$19.95pp (spare or replacement-limit 1 per order)

DISK BOARD "B" W/NMI SAVE

Bare pc with JLO SAFE Disc Basic eprom: \$26.95pp

Kit of board with parts: \$45.95pp

Assembled & tested: \$63.95pp

PACKAGE OF BOTH DISK BOARDS "A" & "B" W/NMI SAVE

Bare pcs only with JLO SAFE Disk Basic eprom: \$43.95pp

Kit of both boards with parts: \$99.95pp

Both boards assembled & tested: \$127.95pp

Both boards, assembled & tested w/2-drive data cable: \$139.95pp

The DiskWorks! Both bds assd w/2-driv data cable & assd 2068 Expansion Bd: \$189.95pp

-FACTS CONCERNING THE OLIGER 2068 FLOPPY DISK SYSTEM-

Both printed circuit boards feature plated through holes, no jumper wires, and all edge traces richly gold plated. The Oliger 2068 Expansion Board IS REQUIRED to connect these boards to your TS2068 computer.

The JLO SAFE (Simple And Fast Extended) Disk Basic V2 eeprom supplied with the Disk "B" board was written by John Olinger for use on this system. SAVING & LOADING using JLO SAFE V2 is very straightforward, using the EXACT same syntax the regular cassette commands use, but with the character "/" following the SAVE/LOAD command. An example of SAVING a Basic program with variables would be SAVE /"FILENAME" or SAVE /"FILENAME" LINE n. JLO SAFE V2 supports ALL the various types of SAVE/LOADS supported by the cassette in ALL the regular combinations. This includes Basic programs (regular & autorun), CODE/SCREEN\$ files (LOADED with SAVED defaults to use if LOADING parameters are not specified, just as the cassette commands do), numeric arrays, character arrays (DATA), and two NEW types of files; VAL for variables SAVE/LOAD and ABS for TOTAL STATE SAVE/LOADS (IE: EVERYTHING is LOADED or SAVED!). JLO SAFE V2 supports up to 177 files per disk (plus a special file 0) and its total formatted capacity is variable depending of the type of drive used with the system. SAFE V2 can support disk track densities up to 255 tracks/double sided (if they existed now) or as small as 10 track single sided if such a small capacity drive existed. Using a 80 track double sided drive with SAFE set for 80 track/double sided, 795K of formatted disk space is free on a newly formatted disk. If you can squeeze 83 tracks out of your drive, you will end up with 825K of formatted disk space! A 40 track double sided drive will leave you 395K of free disk space at 40 tracks and a 40 track single sided drive will leave 195K of free disk space at 40 tracks.

SAVE/LOAD speed is as fast or faster than any other 2068 DOS available. SAFE V2 can SAVE/LOAD 48K in less than 4 seconds total. SAFE V2's CATalog can display every file currently stored on the disk, with the familiar "scroll?" prompt used just like is normally done with a long Basic listing.

This disk I/F w/JLO SAFE V2 is compatible with the 2068 in regular 2068 mode, Spectrum emulator/Romswitch mode, or Zebra OS64 cartridge mode. SAFE sets itself up to support any of these configurations on power up, totally transparent to the user. JLO SAFE will also work w/all AROS cartridges and has built-in software support for the Oliger 2068 Printer Port; No more loading of printer drivers! But, you CAN still use your 2040 printer as usual with SAFE V2 if desired.

Also now STANDARD on the Oliger 2068 Disk I/F is the NMI pushbutton SAVE feature, allowing the use of the Disk I/F with just about every piece of software a person could have at the press of a button. This Disk I/F w/SAFE V2 can support up to 4 double density 3", 3 1/2", or 5 1/4" drives.

In summary, the Oliger 2068 Disk I/F w/JLO SAFE V2 is very likely the fastest most user friendly disk system available for the 2068, period. It is compatible with 2068, OS68, or Spectrum modes of the 2068, and will work transparently with AROS cartridges, be the Oliger User Cartridges or Timex Command Cartridges. In my opinion, it is simply the BEST disk system available for the TS2068.

John L. Olinger

DISK MANUAL ONLY - \$2.50 pp  
(YOU CAN READ ABOUT THE SYSTEM BEFORE YOU BUY!)

# OLIGER DISK I/F W/JLO SAFE SPECIFICATIONS

Number of drives supported: 1, 2, 3, or 4

Number of sides per drive: 1 or 2

Number of tracks per side: 10 - 255 allowed. Most drives allow only 40 or 80.

Amount of 2068 ram or memory space used by DOS: NONE

Bootting of DOS required?: NO. SAFE is contained on an eprom in another bank.

SAVE/LOAD transfer speed: 250K bits per second (32K bytes per second)

True LOAD speed with DOS overhead: 48K bytes in aprox. 4 seconds

True SAVE speed with DOS overhead: 48K bytes in aprox. 7 seconds (Auto Verifys)

Formatted capacity per disk: 40 track double sided=395K  
80 track double sided=795K  
83 track double sided=825K  
40 track single sided=195K

Maximum number of files allowed per disk: 177

Disk allocation cylinder size: 5K

Double Density: YES, always

Compatible with Spectrum mode 2068?: YES

Compatible with OS64 cartridge?: YES

Compatible with AROS cartridges?: YES

Snapshot SAVE?: YES

Other functions supported by snapshot SAVE button? YES. Also supports a SCREEN\$ SAVE to disk, a screen copy to the Oliger Printer Port, or a return to Basic.

Big printer support built in? YES. Supports Oliger Printer Port and some combinations of the Aerco Printer I/F used with some printers.

File types supported by DOS: ALL cassette type files are supported in all the possible combinations along with a new variables only SAVE/LOAD and total state (everything) SAVE/LOAD.

Command Syntax easy to learn? YES. SAVE/LOAD commands are EXACTLY as is required for the cassette commands but with the "/" character immediately after the SAVE or LOAD keyword. EG: SAVE /"Program" LINE 1 or LOAD /"screen" SCREEN\$

JLO SAFE V2.32 ©1987, J. Oliger

DISK NAME: INV 11/11/86  
FORMATTED @85 TRACKS, 2 SIDE(S)  
CAPACITY: 169 CYLS/845K BYTES  
FREE: 125 CYLS/625K BYTES

INVOICE WR BASIC 3CYL/13146BYTS  
invoice wr BASIC 3CYL/13140BYTS  
VERIFY STATE 10CYL/49664BYTS  
ERASED? STATE 10CYL/49664BYTS  
spec code BYTES 4CYL/16384BYTS  
SPEC CODE BYTES 4CYL/16384BYTS  
BAD FILE BYTES 4CYL/16384BYTS  
SPEC CODE3 BYTES 4CYL/16384BYTS  
VERIFYBAS BASIC 1CYL/436BYTS  
BASIC BASIC 1CYL/67BYTS

TOTAL FILES: 10 + FILE 0

ACTUAL EXAMPLE OF A 'CAT' ON SYSTEM

↑ ↑ ↑



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2068 EPROM PROGRAMMER      Bare board:\$12.95      Board w/pts (no eeproms):\$25.95  
2068 Pgmr asmbld & tstcd:\$33.95      Add \$3.00 per board for gold plated edge traces.

This board adds the capability of programming 2764 & 27128 eeproms to your 2068 system. This one is a must for serious use of the 2068 User Cart board. This board comes with complete documentation on its assembly, use, theory of operation, tips, and details on replacing the Home rom of the 2068 w/a 27128 eeprom. This programmer requires the Vpp Power Supply (below, recommended) or a 4-22VDC regulated adjustable power supply w/voltmeter. This board features PLATED THROUGH HOLES. NOTE: This programmer may also be used on the TS1000 for 2764s only, and in fact responds to software exactly like the TS1000 2764 programmer when this board's select switch is set to "64". This board replaces the Oliger TS1000 2764 programmer but you can only program 2764 type eeproms on the TS1000/ZX81 with this board. If ordering for use on the TS1000, request the TS1000 programmer's documentation on ordering and this will be included with your order at NC.

Board w/bd mounting pts:\$9.95

2068 PARALLEL PRINTER PORT	Bare board w/cassette:\$16.95	Kit of board w/parts:\$24.95	FOR P. PORT w/O CASSETTE, DEDUCT \$5.00 (we w/DISK IF SOFTWARE)
Assembled & tested:\$30.95	Bare board w/cass (gold):\$19.95	Gold board w/parts:\$27.95	
Asd & tested (gold):\$33.95	Printer cable for this port:\$14.95	(standard Apple II to Epson type, 3ft.)	
Print software cassette only \$6.95			

Kit of board w/parts:\$24.95 *FOR P. PORT w/O*  
Gold board w/parts:\$27.95 *CASSETTE, DEPUIT*  
*\$5.00 (w/ie w/DISK*

Gold board w/parts: \$27.95 <sup>CASSETTE, DEFECT</sup> \$5.00 (w/ 1015K)

Printer cable for this port: \$14.95 (standard Apple II to Epson type, 3ft.) <sup>IF</sup> <sub>SOFTWARE</sub>

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Kit of board w/parts:\$16.95

Also available with gold plated edge traces @ \$3.00 add. per bd.

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THE JOHN OLIGER CO.

11601 WHIDBEY DR.

CUMBERLAND, IN 46229

CITY, STATE, &amp; ZIP:

Comments or suggestions:



THE JOHN OLIGER CO.  
PRODUCT LIST FOR THE ZX81/TS1000

NOTE: 2068 PROJECTS ARE RECOMMENDED OVER TS1000 PROJECTS. 2068 PROJECTS ARE OF MUCH MORE RECENT DESIGN...WE ALL GET BETTER WITH EXPERIENCE!

WE PAY POSTAGE (First Class) on all orders to continental USA or Canada. Other foreign countries add 10% for post/packing. Indiana residents add 5% sales tax. Prepaid orders only, no credit cards. Prices subject to change without notice. Allow 3-4 weeks on all ZX81/TS1000 project orders as these boards are made in house to order at this time. All projects are designed for the ZX computer electronics experimenter/hobbyist with at least some experience at electronic kit building. All boards except the Vpp Supply are double sided with edge connector "fingers", and are meant to be used in either of the two expansion boards, below. All boards are G10 or FR4 epoxy substrate with solder plated traces. All are completely cut and drilled, but no ZX81/TS1000 board features plated through holes. Feedthrough wires must be installed by the user when building. I offer a 10 day money back satisfaction guarantee on all my products if the product is returned AS RECEIVED in that amount of time. Exchanges will also be honored for this period too if sufficient funds for return postage of the exchanged product are sent with the return. No returns or exchanges will be accepted after 10 days of your order's receipt. Documentation included with each project is detailed in each project's description. Many projects require having read articles previously published in the now defunct SQ magazine.

**64K DYNAMIC RAM**

Bare board: \$19.95

Kit of board w/parts: \$34.95

Kit does NOT include the ram chips themselves. Builder must purchase these separately from other sources listed with project (currently about \$2.95ea from JDR Microdevices). This 64K DRAM board, featured in SQ#3 (Xerox copy avail. @ \$2.50pp) is a full feature 64K ram board for the TS1000, TS1500, or ZX81. Special features of this memory not found on other 64K rampacks include: 8-12K on/off switch, 12-16K on/off switch, two banks of 8K ram available mapped 8-16K (Bank A/B switch), and 48-64K on/off switch. This circuit uses "pin 1 refresh" type 4164 dram chips for reliable refresh on the ZX81, TS1000, and TS1500 computers.

**PARALLEL PRINTER PORT**

~~Bare board: \$10.95~~

~~Kit of board w/parts: \$22.95~~

This project was detailed completely in SQ#s 1&2, and the reading of this two part article is a must for the project builder. (Xerox copy of this available @ \$5.00pp) The actual port is memory mapped at location FFFFH, and is completely decoded. This project only includes its schematic, a theory of operation sheet, and a mc listing w/comments of a copy routine for use with the Okidata ML80 and ML82A printers. The circuit and software can be adapted to most other Centronic compatible printers. To achieve full use of the basic printer commands, the Sinclair rom must be patched by putting it on eprom. (Detailed in article) Thus, access to an eprom programmer and reader is a must to make the port user transparent. Because the 2764 programmer and reader used in the original article are no longer available, it is now suggested that the 2764 programmer be used and a 2764 eprom be installed inside your computer, requiring 2 trace cuts and 2 jumpers to your ZX81 or TS1000 computer. An additional 2764 reader can then be used in the 8-16K area to hold another 2764 that contains the actual printer driver software. (Or use the Video Project Board "B" if you also have this) This board requires rom and Ram decode via use of a 64K memory etc., and is recommended only to the serious hacker. NOTE: Two new software titles are now available that support this printer interface add-on. The Oliger #489918A Video Project described later. The first is entitled "SMART TEXT ZX/TS" from Gulf Micro Electronics (1317 Stratford Ave. Panama City, FL 32404) This package is a text editor/WP that includes many functions-including "Interactive Office Tools". Written entirely in Basic for easy custom modification, this program includes a 35 page manual with possible updates for users in the future. Price is \$29.95pp. Specify use for standard ZX/TS or Oliger VDP when ordering-enclose a SASE for more info. The second new(?) program supporting this port and/or the Oliger VDP system is the ram based version of "Memotext" from Fred Nachbaur (C-12, Mtn. Station Group Box, Nelson, BC V1L 5P1, Canada). Fred has several versions of this program available for different locations in ram (8-16K area, top of 16K ram area, or 32-48K area if mc mod. from SQ or SWN is added to your ZX/TS and you have the memory here). This is the famous WP originally released as a hardware add-on for your computer, now available on tape with many additional enhancements added. Prices are \$29.95 US \$\$ post paid for the cassette version (specify area of memory desired for its use when ordering) or \$34.95 for a version on eprom made to run from the video project's board "B" Eb eprom socket. The eprom version is currently under development and will feature full upper and lower case characters on the screen using the video project! Please inquire to Fred as to availability of this eprom or for more information on the tape version.

**2764 EPROM PROGRAMMER**

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THE TS1000 2764 PROGRAMMER IS NO LONGER AVAILABLE. THE 2068 EPROM PROGRAMMER SET TO "64" FOR 2764 EPROMS DIRECTLY REPLACES THE OLDER TS1000 PROGRAMMER. ORDER THIS PROGRAMMER FROM PRICES LISTED ON THE 2068 PRODUCT LIST AND REQUEST THE OLDER TS1000 2764 PROGRAMMER'S DOCUMENTATION TO PROGRAM EPROMS ON THE TS1000. YOU CAN ONLY PROGRAM 2764 EPROMS ON THE TS1000 WITH THE 2068 PROGRAMMER. YOU WOULD NEED A 2068 TO ALSO PROGRAM 27128 EPROMS. (Rom decode via use of Oliger 64K memory, etc., required for the programmer's use on the ZX81/TS1000).

**Vpp POWER SUPPLY**

Bare board: \$4.49

Board w/bd mounting parts: \$9.95

See the Oliger TS2068 Product list for details on this one.

2764 \* 2 EPROM READER

Bare board:\$10.00 or 3@\$25.95

Board w/parts:\$15.95 or 3@\$39.95

While small in size and complexity, this board is versatile in that it is capable of mapping either of its 2764 eeproms anywhere in the 64K map in 8K blocks (within reason). This board is intended to be used as a "cartridge" for storing Sinclair programs on eeprom, although it may be used to store commonly used mc "tools" etc. in the 8-16K block. This board comes only with its schematic, assembly instructions, and theory of operation sheets as full details of its use as a cartridge are provided with the 2764 Programmer's documentation. Rom and ram decoding via use of Olliger 64K memory is required. This circuit itself can decode the rom if one jumper is installed.

# MEMORY ACCESS MONITOR

Bare board:\$5.95

Kit of board w/parts:\$9.95

This very small board is a very simple circuit that indicates via use of eight LEDs where in the 64K memory map the Z80 cpu is reading or writing. The circuit uses only one IC and is extremely easy to assemble. Although this circuit does not actually do anything, it can be very useful in debugging hardware projects and mc programs that cause the computer to crash by indicating where the cpu is after the crash. Only a schematic is included with this one because it is simple enough to only require this for construction. This circuit also works well on the TS2068.

TMS9918A VIDEO PROJECT/UPGRADE

Bare board "A":\$14.95

Kit of board "A" w/parts:\$37.95

Bare board "B":\$11.95

Kit of board "B" w/parts:\$17.95

Complete package of boards "A" w/parts and board "B" w/parts:\$48.95 (Save \$6.85!) (Parts kits do NOT include the TMS9918A VDP, its 10.7386Mhz crystal, or the required 2764 eeprom. Sources are listed in the documentation included for purchasing the VDP and crystal.) This project (my most complex to date) is a very involved upgrade for your ZX81/TS1000 computer. Its main features allow a SLOW mode almost as fast as FAST mode, a BLINK FREE FAST mode, lower case characters on screen instead of upper case inverse characters, etc. This project requires a composite type video monitor, the 2764 or 2068 Eeprom Programmer, the Video Cassette (below) to make programming easier, and a lot of kit building knowledge! For more details on this one, please send a SASE. This project includes COMPLETE documentation and source listing w/comments of the new firmware.

TMS9918A VDP ENHANCED BASIC PROGRAMMING CASSETTE for use with the video project:\$6.95

4-SLOT TS1000 EXPANSION BOARD

Bare board:\$10.95

Kit of board w/parts:\$32.95

6-SLOT TS1000 EXPANSION BOARD

Bare board:\$15.45

Kit of board w/parts:\$43.95

Either of these two expansion boards are required to "plug" the other boards listed above into your system. The 4-slot board features four 25/50 pin double read out "slots" along with three 20 pin experimental IC socket pad areas. The 6-slot board is similar to the 4-slot, but has six "slots" and six 20 pin IC socket pad areas for user circuits. No buffering circuitry is included on either board. The complete kits contain fully cut and slotted prime edge connectors, IC sockets, and hardware to use as "feet" for the board.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

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## ORDER FORM

THE JOHN OLIGER CO.

11601 WHIDBEY DR.

CUMBERLAND, IN 46229

NAME:

ADDRESS:

CITY, STATE, &amp; ZIP:

[illegible]

Have you ordered from John Olliger Co. before?

Comments or suggestions:



THE JOHN OLIGER CO.  
11601 WHIDBEY DR.  
CUMBERLAND, IN 46229

PRODUCT LIST FOR THE TS2068

WE PAY POSTAGE (First Class) on all orders to continental USA or Canada. Other foriegn countries add 10% for post/packing. Indiana residents add 5% sales tax. Prepaid orders only, no credit cards. Prices subject to change without notice. NOTE: All of the boards below, as well as all future John Oliger Co boards, are designed with edge trace "fingers" to fit the 2068 Expansion Board below. The ONLY exception to this is the 2068 User Cartridge, which plugs into the cartridge slot on your computer and the Vpp Supply which is a free standing board. All my kits include a 10 day money back satisfaction guarantee, if returned UNSOLDERED and in same condition recieved. Assembled units are guaranteed to work as promised or will be repaired free for 30 days from shipment date, if faulty in material or workmanship.

2068 USER CARTRIDGE BOARD                      Bare board:\$11.95 (or 3@\$31.95)                      Board w/parts (ex eeprom):\$15.95  
3pcs board w/parts:\$45.95                      Assembled & tested:\$20.95ea or 3 for \$59.95 post pd (no eeproms)

Also available w/gold plated edge traces. Add \$3.00 per board to above prices for these gems.

ATTN: Software Producers & Users Groups: Write for a quote on quantities of 10pcs. or more.

This board is designed to plug into the cartridge port of the 2068 computer. The board can hold 2-2764 or 2-27128 eeproms in any combination. It allows the 2068 computer owner, when used with the 2068 or TS1000 programmers, to store his own Basic programs in cartridge form for fast and easy access. The board's purchase includes assembly instructions, schematic, and instructions for its use with Basic programs. Although this board CAN be used with MC programs or to make such things as Spectrum Emulators, the documentation included with the board does not cover these uses because of thier complexity. This is left to the user to figure out, hopefully with the help of the TS2068 Technical Manual. This board features PLATED THROUGH HOLES and is VERY easy to assemble.

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2068 EXPANSION BOARD                      Bare pc board:\$14.95                      Board w/parts:\$43.95

Assembled and tested Oliger 2068 Expansion board \$54.95.

Also available with gold plated rear edge traces. Add \$3.00 per board to above prices for these. This compact (3 3/4" \* 4 3/8") expansion board is designed to plug into the rear expansion connector of your 2068 computer. All of the 2068 boards from John Oliger Co., except the 2068 User Cart board are designed to plug into this expansion board, (the boards have male edge traces, and plug into this board similar to the way new boards are plugged into the Apple computer) so this one is a must if you plan on adding more circuits to your 2068 with John Oliger Co. products. The board includes one "spare" 20 pin ic socket for a user circuit, a rear edge connector feedthrough for attaching the 2040 printer, modem, etc., and the nec. circuitry for an ultra stable RGB monitor interface. (NOTE: The use of the RGB circuitry requires opening your 2068, cutting one trace, and installing one jumper.) The board's purchase includes assembly instructions and a schematic of the RGB interface. The parts kit for this one includes five precut & slotted edge connectors, 2 ic sockets, 1 74HC00 IC, and 1pc 47K Ohm 1/4W resistor. This board features PLATED THROUGH HOLES. NOTE: This board requires good soldering abilities for assembly as there are many narrow pads surrounded by board traces to be soldered. This board requires more intricate soldering than any other Oliger Co. printed circuit board. If you are not GOOD at fine detail soldering I recommend buying this board assembled.

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2068 EPROM PROGRAMMER                      Bare board:\$12.95                      Board w/pts (no eeproms):\$25.95

2068 Pgmr asmbld & tstcd:\$33.95                      Add \$3.00 per board for gold plated edge traces.

This board adds the capability of programming 2764 & 27128 eeproms to your 2068 system. This one is a must for serious use of the 2068 User Cart board. This board comes with complete documentation on its assembly, use, theory of operation, tips, and details on replacing the Home rom of the 2068 w/a 27128 eeprom. This programmer requires the Vpp Power Supply (below, recommended) or a 4-22VDC regulated adjustable power supply w/voltmeter. This board features PLATED THROUGH HOLES. NOTE: This programmer may also be used on the TS1000 for 2764s only, and in fact responds to software exactly like the TS1000 2764 programmer when this board's select switch is set to "64". This board replaces the Oliger TS1000 2764 programmer but you can only program 2764 type eeproms on the TS1000/ZX81 with this board. If ordering for use on the TS1000, request the TS1000 programmer's documentation on ordering and this will be included with your order at NC.

Board w/bd mounting pts:\$9.95

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Kit of board w/parts: \$24.95 *FOR P. PORT w/o*

Gold board w/parts: \$27.95 ~~\$5.00~~ CASSETTE, DEDUCT

Printer cable for this port:\$14.95 (standard Apple II to Epson type,3ft.) <sup>IF</sup> <sub>SEE PAGE 2</sub>

This very small but very capable Centronics type printer port for your 2068 will drive most any printer that has a Centronics type parallel interface. The port uses the same port and BUSY bit assignment used by the Aerco 2068 printer I/F, and thus is compatible with the vast amount of 2068 software that supports this interface. This port is fully decoded and contains a "PRINTER READY" LED to show your printer's current status. Software on cassette included with this port allows use of the standard LPRINT and LLIST commands and use of AT, TAB, and "," the full width your printer is capable of. Also included are hi-res screen dumps (via RAND USR call) for the Okidata dot addressable graphic printers, the Olivetti PR2300 ink jet printer, the Gemini 10X printer, and the Gorilla Banana printer. An ASCII screen dump of ASCII characters is also included for use with ANY printer. Unlike most other 2068 printer driver software, THIS software mainly resides in the 2040 printer buffer, using absolutely none of the ram normally used by Basic and well out of the way for opening DF1LE 2 on the 2068. The printed circuit board is plated through, very easy to assemble, and also avail. w/gold plated edge traces. Annotated assembly listings of the machine code software are included in this port's 15-page user manual (supplied) for ease of customer custom modification and an aid in learning how routines such as these operate on your computer. The software to drive this port is BUILT IN to the Oliger 2068 Disc I/F!

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Kit of board w/parts:\$16.95

Also available with gold plated edge traces @ \$3.00 add. per bd.

This small joystick board is designed to plug into your 2068 expansion board to emulate the Kempston Joystick interface. This interface is for use with a Spectrum emulator, rom, or Romswitch and Spectrum software. It is supported by any Spectrum software that is "Kempston compatible" looking to the software exactly like the real Kempston Joystick interface. Hardware wise this interface differs from the real Kempston in the fact that the port is FULLY DECODED so that there can be no hardware conflicts when using this device with other hardware add-ons and your 2068 (Such as the soon to be released Ollger 2068 Disc Drive Interface). This board features plated through holes and is easy to assemble. The port itself will also function on the ZX81/TS1000/TS1500, but may fight other hardware on these machines that is not fully decoded (such as the Ollger TMS9918A Video Project) and mc will be required on these computers to access the device located at Z80 port 1FH, as the '81 lacks the "IN" command. Documentation Included with the unit covers only its use with the TS2068 computer.

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THE JOHN OLIGER CO.

11601 WHIDBEY DR.

CUMBERLAND, IN 46229

CITY, STATE, &amp; ZIP:

Comments or suggestions:



## OLIGER 2068 DISK SYSTEM PRICES AND BASIC INFORMATION

DISK BOARD "A"

Bare pc only: \$17.95pp

Kit of board with parts: \$55.95pp

Assembled & tested: \$66.95pp

Two drive data cable for above, 3 foot long total: \$16.95pp

Four drive data cable for above, 4 foot long total: \$26.95pp

WD1770PH-00 disk controller chip: \$19.95pp (spare or replacement-limit 1 per order)

DISK BOARD "B" W/NMI SAVE

Bare pc with JLO SAFE Disc Basic eprom: \$26.95pp

Kit of board with parts: \$45.95pp

Assembled & tested: \$63.95pp

PACKAGE OF BOTH DISK BOARDS "A" & "B" W/NMI SAVE

Bare pcs only with JLO SAFE Disk Basic eprom: \$43.95pp

Kit of both boards with parts: \$99.95pp

Both boards assembled & tested: \$127.95pp

Both boards, assembled & tested w/2-drive data cable: \$139.95pp

The DiskWorks! Both bds assd w/2-driv data cable & assd 2068 Expansion Bd: \$189.95pp

-FACTS CONCERNING THE OLIGER 2068 FLOPPY DISK SYSTEM-

Both printed circuit boards feature plated through holes, no jumper wires, and all edge traces richly gold plated. The Oliger 2068 Expansion Board IS REQUIRED to connect these boards to your TS2068 computer.

The JLO SAFE (Simple And Fast Extended) Disk Basic V2 eeprom supplied with the Disk "B" board was written by John Olinger for use on this system. SAVING & LOADING using JLO SAFE V2 is very straightforward, using the EXACT same syntax the regular cassette commands use, but with the character "/" following the SAVE/LOAD command. An example of SAVING a Basic program with variables would be SAVE /"FILENAME" or SAVE /"FILENAME" LINE n. JLO SAFE V2 supports ALL the various types of SAVE/LOADS supported by the cassette in ALL the regular combinations. This includes Basic programs (regular & autorun), CODE/SCREEN\$ files (LOADED with SAVED defaults to use if LOADING parameters are not specified, just as the cassette commands do), numeric arrays, character arrays (DATA), and two NEW types of files; VAL for variables SAVE/LOAD and ABS for TOTAL STATE SAVE/LOADS (IE: EVERYTHING is LOADED or SAVED!). JLO SAFE V2 supports up to 177 files per disk (plus a special file 0) and its total formatted capacity is variable depending of the type of drive used with the system. SAFE V2 can support disk track densities up to 255 tracks/double sided (if they existed now) or as small as 10 track single sided if such a small capacity drive existed. Using a 80 track double sided drive with SAFE set for 80 track/double sided, 795K of formatted disk space is free on a newly formatted disk. If you can squeeze 83 tracks out of your drive, you will end up with 825K of formatted disk space! A 40 track double sided drive will leave you 395K of free disk space at 40 tracks and a 40 track single sided drive will leave 195K of free disk space at 40 tracks.

SAVE/LOAD speed is as fast or faster than any other 2068 DOS available. SAFE V2 can SAVE/LOAD 48K in less than 4 seconds total. SAFE V2's CATalog can display every file currently stored on the disk, with the familiar "scroll?" prompt used just like is normally done with a long Basic listing.

This disk I/F w/JLO SAFE V2 is compatible with the 2068 in regular 2068 mode, Spectrum emulator/Romswitch mode, or Zebra OS64 cartridge mode. SAFE sets itself up to support any of these configurations on power up, totally transparent to the user. JLO SAFE will also work w/all AROS cartridges and has built-in software support for the Oliger 2068 Printer Port; No more loading of printer drivers! But, you CAN still use your 2040 printer as usual with SAFE V2 if desired.

Also now STANDARD on the Oliger 2068 Disk I/F is the NMI pushbutton SAVE feature, allowing the use of the Disk I/F with just about every piece of software a person could have at the press of a button. This Disk I/F w/SAFE V2 can support up to 4 double density 3", 3 1/2", or 5 1/4" drives.

In summary, the Oliger 2068 Disk I/F w/JLO SAFE V2 is very likely the fastest most user friendly disk system available for the 2068, period. It is compatible with 2068, OS68, or Spectrum modes of the 2068, and will work transparently with AROS cartridges, be the Oliger User Cartridges or Timex Command Cartridges. In my opinion, it is simply the BEST disk system available for the TS2068.

John L. Olinger

OLIGER DISK I/F W/JLO SAFE  
SPECIFICATIONS

Number of drives supported: 1, 2, 3, or 4

Number of sides per drive: 1 or 2

Number of tracks per side: 10 - 255 allowed. Most drives allow only 40 or 80.

Amount of 2068 ram or memory space used by DOS: NONE

Bootting of DOS required?: NO. SAFE is contained on an eeprom in another bank.

SAVE/LOAD transfer speed: 250K bits per second (32K bytes per second)

True LOAD speed with DOS overhead: 48K bytes in aprox. 4 seconds

True SAVE speed with DOS overhead: 48K bytes in aprox. 7 seconds (Auto Verifys)

Formatted capacity per disk: 40 track double sided=395K  
80 track double sided=795K  
83 track double sided=825K  
40 track single sided=195K

Maximum number of files allowed per disk: 177

Disk allocation cylinder size: 5K

Double Density: YES, always

Compatible with Spectrum mode 2068?: YES

Compatible with OS64 cartridge?: YES

Compatible with AROS cartridges?: YES

Snapshot SAVE?: YES

JLO SAFE V2.32 ©1987, J. Oliger

DISK NAME: INV 11/11/86  
FORMATTED @85 TRACKS, 2 SIDE(S)  
CAPACITY: 169 CYLS/845K BYTES  
FREE: 125 CYLS/625K BYTES

INVOICE WR BASIC 3CYL/13146BYTES  
invoice wr BASIC 3CYL/13140BYTES  
VERIFY STATE 10CYL/49664BYTES  
ERASED? STATE 10CYL/49664BYTES  
spec code BYTES 4CYL/16384BYTES  
SPEC CODE BYTES 4CYL/16384BYTES  
BAD FILE BYTES 4CYL/16384BYTES  
SPEC CODE3 BYTES 4CYL/16384BYTES  
VERIFYBAS BASIC 1CYL/436BYTES  
BASIC BASIC 1CYL/67BYTES

TOTAL FILES: 10 + FILE 0

ACTUAL EXAMPLE OF A 'CAT' ON SYSTEM

↑ ↑ ↑

Other functions supported by snapshot SAVE button? YES. Also supports a SCREEN\$  
SAVE to disk, a screen copy to the Oliger Printer Port, or a return to Basic.

Big printer support built in? YES. Supports Oliger Printer Port and some  
combinations of the Aerco Printer I/F used with some printers.

File types supported by DOS: ALL cassette type files are supported in all the  
possible combinations along with a new variables only SAVE/LOAD and total state  
(everything) SAVE/LOAD.

Command Syntax easy to learn? YES. SAVE/LOAD commands are EXACTLY as is required  
for the cassette commands but with the "/" character immediately after the SAVE  
or LOAD keyword. EG: SAVE /"Program" LINE 1 or LOAD /"screen" SCREEN\$



# OLIGER 2068 DISK SYSTEM PRICES AND BASIC INFORMATION

+-----+  
 DISK BOARD "A"  
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 Assembled & tested: \$66.95pp  
 Two drive data cable for above, 3 foot long total: \$16.95pp  
 Four drive data cable for above, 4 foot long total: \$26.95pp  
 WD1770PH-00 disk controller chip: \$19.95pp (spare or replacement-limit 1 per order)

+-----+  
 DISK BOARD "B" W/NMI SAVE  
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 Kit of board with parts: \$45.95pp  
 Assembled & tested: \$63.95pp  
 +-----+  
 PACKAGE OF BOTH DISK BOARDS "A" & "B" W/NMI SAVE  
 Bare pcs only with JLO SAFE Disk Basic eprom: \$43.95pp  
 Kit of both boards with parts: \$99.95pp  
 Both boards assembled & tested: \$127.95pp  
 Both boards, assembled & tested w/2-drive data cable: \$139.95pp  
 The DiskWorks! Both bds asssd w/2-drv data cable & asssd 2068 Expansion Bd: \$189.95pp

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The JLO SAFE (Simple And Fast Extended) Disk Basic V2 eprom supplied with the Disk "B" board was written by John Oliger for use on this system. SAVING & LOADING using JLO SAFE V2 is very straightforward, using the EXACT same syntax the regular cassette commands use, but with the character "/" following the SAVE/LOAD command. An example of SAVING a Basic program with variables would be SAVE /"FILENAME" or SAVE /"FILENAME" LINE n. JLO SAFE V2 supports ALL the various types of SAVE/LOADs supported by the cassette in ALL the regular combinations. This includes Basic programs (regular & autorun), CODE/SCREEN\$ files (LOADED with SAVED defaults to use if LOADING parameters are not specified, just as the cassette commands do), numeric arrays, character arrays (DATA), and two NEW types of files; VAL for variables SAVE/LOAD and ABS for TOTAL STATE SAVE/LOADS (IE: EVERYTHING is LOADED or SAVED!). JLO SAFE V2 supports up to 177 files per disk (plus a special file 0) and its total formatted capacity is variable depending of the type of drive used with the system. SAFE V2 can support disk track densities up to 255 tracks/double sided (if they existed now) or as small as 10 track single sided if such a small capacity drive existed. Using a 80 track double sided drive with SAFE set for 80 track/double sided, 795K of formatted disk space is free on a newly formatted disk. If you can squeeze 83 tracks out of your drive, you will end up with 825K of formatted disk space! A 40 track double sided drive will leave you 395K of free disk space at 40 tracks and a 40 track single sided drive will leave 195K of free disk space at 40 tracks.

SAVE/LOAD speed is as fast or faster than any other 2068 DOS available. SAFE V2 can SAVE/LOAD 48K in less than 4 seconds total. SAFE V2's CATALOG can display every file currently stored on the disk, with the familiar "scroll?" prompt used just like is normally done with a long Basic listing.

This disk I/F w/JLO SAFE V2 is compatible with the 2068 in regular 2068 mode, Spectrum emulator/Romswitch mode, or Zebra OS64 cartridge mode. SAFE sets itself up to support any of these configurations on power up, totally transparent to the user. JLO SAFE will also work w/all AROS cartridges and has built-in software support for the Oliger 2068 Printer Port; No more loading of printer drivers! But, you CAN still use your 2040 printer as usual with SAFE V2 if desired.

Also now STANDARD on the Oliger 2068 Disk I/F is the NMI pushbutton SAVE feature, allowing the use of the Disk I/F with just about every piece of software a person could have at the press of a button. This Disk I/F w/SAFE V2 can support up to 4 double density 3", 3 1/2", or 5 1/4" drives.

In summary, the Oliger 2068 Disk I/F w/JLO SAFE V2 is very likely the fastest most user friendly disk system available for the 2068, period. It is compatible with 2068, OS68, or Spectrum modes of the 2068, and will work transparently with AROS cartridges, be the Oliger User Cartridges or Timex Command Cartridges. In my opinion, it is simply the BEST disk system available for the TS2068.

John L. Oliger

DISK MANUAL ONLY - \$2.50 PP  
 (YOU CAN READ ABOUT THE SYSTEM BEFORE YOU BUY!)

# OLIGER DISK I/F W/JLO SAFE SPECIFICATIONS

Number of drives supported: 1, 2, 3, or 4

Number of sides per drive: 1 or 2

Number of tracks per side: 10 - 255 allowed. Most drives allow only 40 or 80.

Amount of 2068 ram or memory space used by DOS: NONE

Bootng of DOS required?: NO. SAFE is contained on an eprom in another bank.

SAVE/LOAD transfer speed: 250K bits per second (32K bytes per second)

True LOAD speed with DOS overhead: 48K bytes in aprox. 4 seconds

True SAVE speed with DOS overhead: 48K bytes in aprox. 7 seconds (Auto Verifys)

Formatted capacity per disk: 40 track double sided=395K  
80 track double sided=795K  
83 track double sided=825K  
40 track single sided=195K

Maximum number of files allowed per disk: 177

Disk allocation cylinder size: 5K

Double Density: YES, always

Compatible with Spectrum mode 2068?: YES

Compatible with OS64 cartridge?: YES

Compatible with AROS cartridges?: YES

Snapshot SAVE?: YES

JLO SAFE V2.32 ©1987, J. Oliger

DISK NAME: INV 11/11/86  
FORMATTED @85 TRACKS, 2 SIDE(S)  
CAPACITY: 169 CYLS/845K BYTES  
FREE: 125 CYLS/625K BYTES

INVOICE WR BASIC 3CYL/13146BYTS  
invoice wr BASIC 3CYL/13140BYTS  
VERIFY STATE 10CYL/49664BYTS  
ERASED? STATE 10CYL/49664BYTS  
spec code BYTES 4CYL/16384BYTS  
SPEC CODE BYTES 4CYL/16384BYTS  
BAD FILE BYTES 4CYL/16384BYTS  
SPEC CODE3 BYTES 4CYL/16384BYTS  
VERIFYBAS BASIC 1CYL/436BYTS  
BASIC BASIC 1CYL/67BYTS

TOTAL FILES: 10 + FILE 0

ACTUAL EXAMPLE OF A 'CAT' ON SYSTEM

↑ ↑ ↑

Other functions supported by snapshot SAVE button? YES. Also supports a SCREEN\$ SAVE to disk, a screen copy to the Oliger Printer Port, or a return to Basic.

Big printer support built in? YES. Supports Oliger Printer Port and some combinations of the Aerco Printer I/F used with some printers.

File types supported by DOS: ALL cassette type files are supported in all the possible combinations along with a new variables only SAVE/LOAD and total state (everything) SAVE/LOAD.

Command Syntax easy to learn? YES. SAVE/LOAD commands are EXACTLY as is required for the cassette commands but with the "/" character immediately after the SAVE or LOAD keyword. EG: SAVE /"Program" LINE 1 or LOAD /"screen" SCREEN\$

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CUMBERLAND, INDIANA 46229  
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